



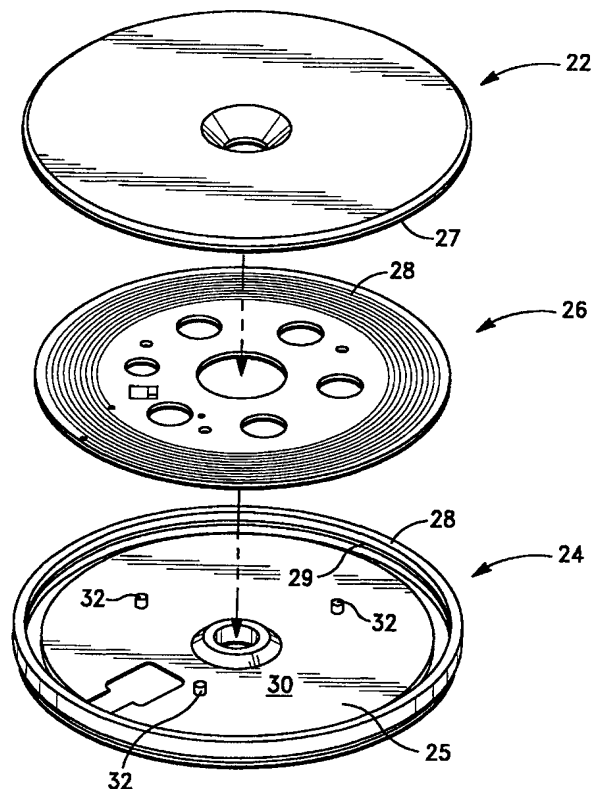
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(54) Title: HIGH TEMPERATURE RFID TAG

(57) Abstract

A high temperature RFID tag (10,20) is described which has a survival temperature in the range of approximately -40°C to 300°C and an operating temperature of approximately -20°C to 200°C . The RFID tag comprises a housing (21) comprising a first thermally resistant material and having a base (24) and a top (22), and a circuit board substrate (26) which includes an IC circuit (28) and is disposed in a tag chamber (36), the substrate comprising a second thermally resistant material which is encapsulated in the housing. The thermally resistant materials exhibit a deflection temperature in a range of 287°C to 320°C .



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AMENDED CLAIMS

[received by the International Bureau on 20 April 1999 (20.04.99);
original claims 1-12 replaced by new claims 1-16 (2 pages)]

1. A high temperature RFID tag, comprising:

a housing having base and a top, said base and said top forming a chamber therein,

5 said housing comprising a first thermally resistant material; and

a circuit board substrate disposed within said chamber, said substrate including an
integrated circuit, said substrate comprising a second thermally resistant material;

said housing and said substrate jointly having a survival temperature in the range
of approximately 220°C to 300°C.

10 2. The RFID tag of Claim 1, wherein said tag has an operating temperature in
the range of -18°C to 135°C.

3. The RFID tag of Claim 1, wherein said circuit board is substrate
encapsulated in said housing.

4. The RFID tag of Claim 3, wherein a high temperature epoxy is employed to
15 encapsulate said circuit board substrate.

5. The RFID tag of Claim 1, wherein said first thermally resistant material
comprises Teflon®.

6. The RFID tag of Claim 1, wherein said first thermally resistant material
comprises a Ryton® PPS compound.

20 7. The RFID tag of Claim 1, wherein said second thermally resistant material
comprises a polyimide.

8. The RFID tag of Claim 7, wherein said polyimide is pre-conditioned.

9. The RFID tag of Claim 1, wherein said second thermally resistant material
comprises a ceramic compound.

10. The RFID tag of Claim 1, wherein said housing has a substantially cylindrical shape.

11. The RFID tag of Claim 1, wherein said housing has a substantially square shape.

5 12. A RFID tag, comprising:
a housing and substrate assembly,
said housing having base and a top, said base and said top forming a chamber therein, said housing comprising a first thermally resistant material,
said substrate disposed within said housing chamber and including an integrated
10 circuit, said substrate comprising a second thermally resistant material,
said housing and substrate assembly having a survival temperature in the range of approximately 220°C to 300°C and an operating temperature range of approximately 18°C to 135°C,
said housing and substrate assembly being capable of exposure to cyclic changes in
15 temperature to and between said operating temperature and said survival temperature without substantially affecting the intended functions of the tag.

13. The RFID tag of Claim 12, wherein said substrate is encapsulated in said housing chamber with a high temperature epoxy.

14. The RFID tag of Claim 12, wherein said first thermally resistant material
20 comprises a Ryton ® PPS compound.

15. The RFID tag of Claim 12, wherein said second thermally resistant material comprises a pre-conditioned polyimide.

16. The RFID tag of Claim 12, wherein said second thermally resistant material comprises a ceramic compound.